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CONTENTS

Ethical Base of J. Habermas' Critical Socialtheory
Toshihiko HIRAI 1

A Multi-Sectoral Econometric-Model Divided by Social Strata of the Japanese Economy
Masanori NOZAWA
Hiroshi OHNISHI 15

The Cost of Marriages and Marriage-Related Saving in Japan
Charles Yuji HORIOKA 47

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A MULTI-SECTORAL ECONOMETRIC-MODEL DIVIDED BY SOCIAL STRATA OF THE JAPANESE ECONOMY

By Masanori NOZAWA* and Hiroshi OHNISHI**

I Introduction—The Importance of the Social Strata Analysis to obtain an Econometric-model of the Japanese Economy

It is necessary, in our opinion, to introduce a social strata analysis into the econometric-model of the Japanese economy[1], for the following reasons.

Firstly, all economic agents are divided in various social classes and social strata which have different social characteristics. The population is composed of many social strata by differences of ages, sexes, occupations, industries, incomes, assets, conditions of houses, regions, etc., and the differences between these social groups are gradually increasing in recent years. Moreover, the economic structure in Japan can be considered "dual": big businesses vs small businesses, and export-oriented industries (automobile, electronics, etc.) vs traditional declining ones (steel, mining, textile, etc.). The rapid structural changes which we have experienced in the industrial relations after 1975 are accelerating the change in the composition of social strata. Therefore, the macro econometric-model without any social strata division is not sufficiently realistic today.

Secondly, all economic policies have different effects between the different social strata. So, in order to examine closely the significance of various policies, especially of so-called welfare-oriented policies, on the different social groups, it is very useful to adopt the point of view of social strata analysis. We can compare the effects of actual policies and those of alternative policies which aim at an increase in employment, the improved welfare, amelioration of conditions of small businesses, protection of the natural environment and stable growth in favor of people's lives, by the construction and simulation of the econometric-model divided by social strata.

II Purpose of MESO Model

The objective of this paper is to observe the effects of various policies regarding

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1) Our opinion is based on a collaborate study directed by Professor Nobuo Okishio (Kobe University). See, N. Okishio & M. Nozawa (ed), *The Quantitative Analysis of the Japanese Economy* (in Japanese). Ohzuki Shoten, 1983. M. Nozawa is responsible for the Chapter I (Introduction). Chapter II, III, IV, tables and lists were written by H. Ohnishi.

different social strata, as well as to survey the effects of policies discriminating against the different social strata. In order to achieve this, however, we must first expound on the purpose and problems of the Multi-sectoral Econometric-model divided by Social Strata (hereinafter referred to as the MESO Model[2]) which we are using in our analysis.

2.1 Realistic Requirements of an Analysis of Policies Discriminating against the Different Social Strata.

The various economic constituents in the present world do not make up a uniform group. What is commonly called "households" can be divided into groups of high-income earners and low-income earners, and what is collectively referred to as "business enterprises" can be divided into groups of big businesses, small businesses, individual enterprises, and so forth. Accordingly, each group has its distinct interests, and the existence of these differences realistically call for an analysis regarding the effects of policies discriminating against the different social strata. The following are some examples.

(1) First of all, what primarily demand an analysis of stratum-differentiated effects are the economic policies directly discriminating against the different social strata. For instance, according to the 6th Report by the study group seeking a new source of revenue for Tokyo Metropolitan Government "An Urgent Problem of Public Finance of Tokyo Metropoliatn Government" (1978), the tax burden ratio starts decreasing beyond the income bracket of 2 to 3 million yen. This is caused by the fact

Table 1. Tenure of Dwelling of Various Social Strata.
(1978, ordinary households)

employment status of main earner and annual income of household	owned houses	rented houses owned			issued houses	total
		by loc. gov.	by pub. corp.	privately		
individual proprietor	79.4	2.1	0.8	17.3	0.4	100.0
employee	54.4	6.5	3.0	27.7	8.4	100.0
under 3 million yen per year	42.8	9.3	2.8	37.8	7.3	100.0
3–7 million yen	70.1	2.7	3.4	13.7	10.1	100.0
over 7 million yen	85.8	0.4	0.9	5.2	7.7	100.0

source: *Housing Survey of Japan* (1979)

* Annual average salary for executives of private non-banking corporate enterprises with over one billion yen share capital is 7130 thousand yen, and that with under one billion yen share capital is 2870 thousand yen (1978 fiscal year).

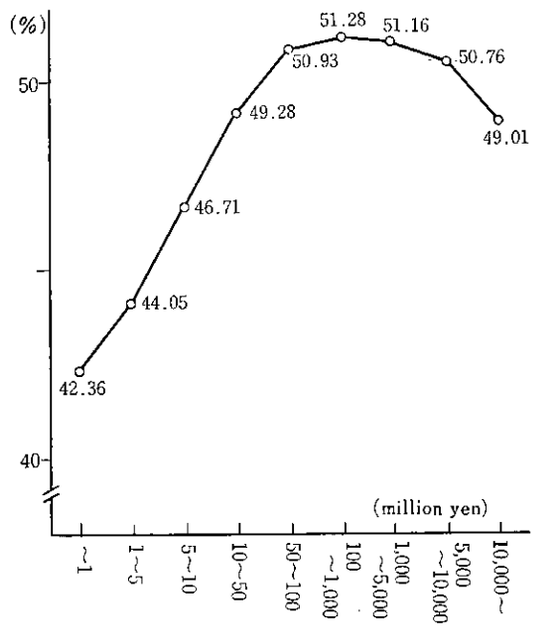
2) My partner who assisted in building the MESO model is Masahiro Ogawa, associate professor of Osaka University of Economics. See, M. Ogawa, "An Econometric Model Divided by Social Classes of the Japanese Economy" (in Japanese), Kyoto University Economic Society, *Keizai Ronso* (*The Economic Review*), Vol. 130, No. 5·6, 1982, and M. Ogawa, "The Simulation of the Econometric Model Divided by Social Classes" (in Japanese), Kyoto University Economic Society, *Keizai Ronso* (*The Economic Review*), Vol. 131, No. 4·5, 1983.

that high-income earners obtain a low ratio of salary income which is taxed progressively, and have a high ratio of property income, such as interest income, dividend income, and land transaction income, which are taxed at low-ratio separately. Then, what must be noted here is that a stratum-discriminatory system is practiced even in income tax policies. Consequently, as a result of the existence of conflicting interests, a stratum-differentiated analysis on the effects of the differences in income tax distribution becomes necessary.

(2) A similar anti-progressive structure can be seen in the corporate tax system. For example, let us look at Fig. 1. In this figure, with a capital of 1 billion yen as the dividing line, the real tax burden ratio decreases as the size of the capital exceeds 1 billion yen. Therefore, a stratum-discriminatory system is also practiced in corporate tax policies. Accordingly, here again, we must analyze the distribution differences in corporate taxation at each social stratum.

(3) This type of direct "stratum-discriminatory policy" can be found also in government loan policies.

Figure 1. Real Corporate Tax Rates with Classification by Scale of Enterprises (1981)



scales of share capitals

(source) National Tax Board, 'True Nature of Corporate Enterprises'

* 'Real Corporate Tax Rate'
=the amounts of corporate taxes/(the amount of corporate incomes+the amount of enterprise taxes in the last year−expenses recognized by Special Taxation Measures Law)×100

As an example, the interest rates of government loaning agents for small businesses is higher than the interest rates of these for big businesses.

(4) Finally, more direct stratum-discriminatory policies exist such as those which switch the receiver of a fiscal expenditure order from big businesses to small businesses, and these also call for an analysis of the stratum-discriminatory policy effects.

In conclusion, it is clear that the reality of interest conflicts among social strata demand a macroeconomic analysis and a stratum-differential analysis of discriminatory policy effects, and some model study projects have existed previously to meet this demand. The first type of study was carried out on separate equations of subjects such as investments, employment, wages, or consumption. S. Nishikawa, E. Shinozuka, or T. Mizoguchi's works[3] are examples of this type of study. However, since their projects were limited to the separate equations themselves, they could not analyze the total or reciprocal effects of each social stratum's behavioral differences. The second type of model study on stratum-differential effects focused on input-output models accordingly to the size of the businesses. An example of this is S. Kinoshita's analysis[4] of the effects of the final demand structure according to the size of the businesses; nevertheless, such input-output models were limited to examining the repercussions of final demand which was influenced by intermediate demand, and they did not consider the stages at which final demand was changed through distribution and redistribution. Therefore, they did not permit a simulation of changes in distribution or redistribution, or a simulation of financial policies. Here, in order to overcome the deficiencies of the above two stratum-differential analytic models, we are constructing a multi-sectoral econometric-model divided by social strata.

2.2 The Incorporation of Behavioral Pattern Differences of Social Strata

As we have seen already, what we macroeconomically refer to as "businesses" or "households" include various heterogeneous groups and conflicting groups. Therefore, it is problematic to represent these different groups in one comprehensive equation. Especially, by such aggregate macroequations, we cannot completely recapitulate the fact that the composite ratio of these various heterogeneous groups fluctuate amidst their unceasing conflicts. That is, one kind of structural changes occurs. In order to consider this problem, let us hypothesize two groups with different propensities to consume (one group with 0.8 P.C. and another group with 0.5 P.C.). First of all, if we suppose the total income of both groups are 1 trillion yen each, the total consump-

3) See, S. Nishikawa, "The Industrial Production Functions and Its Scale Coefficients" (in Japanese), The Japan Association of Economics and Econometrics, *The Economic Studies Quarterly*, Vol. XI, No. 1.2, 1960. E. Shinozuka, "Recent Employment Adjustment Seen with Classification of Enterprises", in T. Nakamura & S. Nishikawa (ed), *Modern Analysis of Labor Market* (in Japanese), The General Research Association of Labor Problem, 1980. T. Mizoguchi, *"A Statistic Analysis of Consumption Function"* (in Japanese), Iwanami Shoten, 1964.

4) S. Kinoshita, "The Repercussion Effect of Public Investment in the Region—by the Regional Input-Output Tables" (in Japanese), Gifu Institute of Economics, *Gifu Keizaidaigaku Ronshu* (*The Journal of Gifu College of Economics*), Vol. 14, No. 3, 1980.

tion of the whole society will be 0.8×1 trillion yen $+0.5\times1$ trillion yen $=1.3$ trillion yen, and the whole society's propensity to consume will be $1.3/2=0.65$. However, if the total income of the 2 groups are 2 and 1 trillion yen respectively, what will happen? Since the total consumption of the whole society will be 0.8×2 trillion yen $+0.5\times1$ trillion yen $=2.1$ trillion yen, the whole society's propensity to consume becomes $2.1/3=0.7$. In short, a change in the composite ratio of the heterogeneous groups will produce a change in the comprehensive—macroeconomic behavior of both groups. Therefore, we must avoid treating groups with considerable heterogeneous characteristics in a collective manner.

Even among large-scale econometric models, some stratum-divided models exist. For example, J. Tinbergen, J.R. Klein, and A.S. Goldberger[5] have used separate explaining-variables for groups with different propensities to consume (e.g. the employer's disposable income or the non-agricultural, non-wage income) instead of treating their consumption functions collectively. Moreover, the "Medium-Term Macroeconometric Model of 1976"[6] has divided the price index into an index for larger enterprise products and an index for smaller enterprise products. However, this is not a complete division covering all aspects of expenditure, production, and distribution. On the other hand, the "6th Multi-Sectoral Model"[7] uses the new SNA (System of National Accounts, United Nations) as its basis, and categorically divides the businesses by institutional sectors: private, public, and personal enterprises. In this sense, this model comes closer to a categorical disaggregation by social strata. Nonetheless, since it does not include the more important and direct division between big businesses and small businesses, it cannot act as an ideal multi-sectoral model divided by social strata.

III The Contents of the MESO Model

3.1 Division of Economic Constituents by Social Strata

As previously stated, the major characteristic of our model lies in its division of economic constituents, namely, businesses and households, by social strata. First, let us expound on the dividing method regarding businesses. We have defined businesses into four categories:

"big businesses": private, non-financial corporate entities with capital of over 1 billion yen

"small businesses": private, non-financial corporate entities with capital of less than 1 billion yen

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5) J. Tinbergen, *Business Cycles in the United States of America*, 1919–1936, League of Nations Economic Intelligence Service, 1939. L.R. Klein & A.S. Goldberger, *An Econometric Model of the United States* 1929–1952, North Holland, 1969.

6) Division for Econometric Model Analysis, Planning Bureau, Economic Planning Agency, *Econometric Models for the National Economic Plan for the Second Half of the* 1970's, 1977.

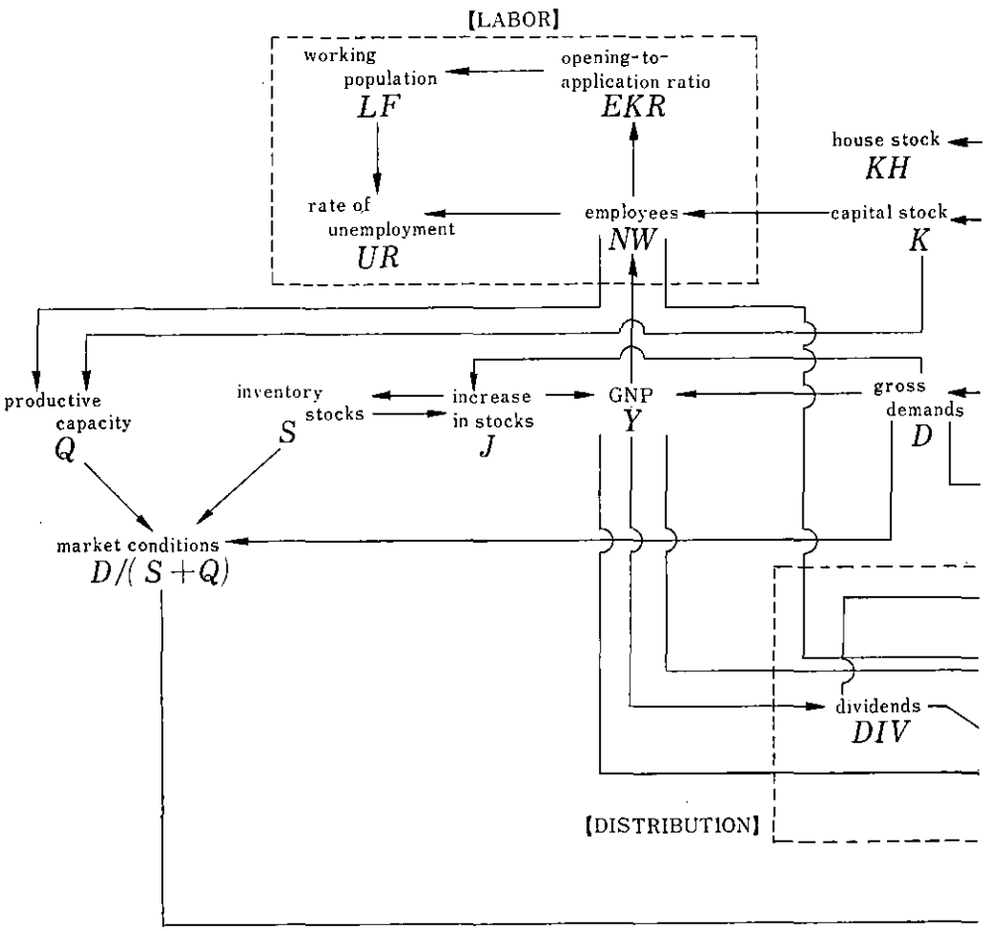
7) Division for Econometric Model Analysis Planning Bureau Economic Planning Agency, *Econometric Model for the New Economic and Social Seven-Year Plan—A Preliminary Paper to the Official Report by the Committee for Econometric Model Analysis*, 1979.

"other enterprises':' public institutions and financial institutions

"personal enterprises": personal enterprises including "farmers" as its subdivision

On the other hand, humans were divided into groups of "workers of big businesses", "workers of small businesses", "executives of big businesses", "executives of small businesses", "workers of other enterprises", "self-employed persons", and "farmers":

Figure 2. Flow-chart of the Model



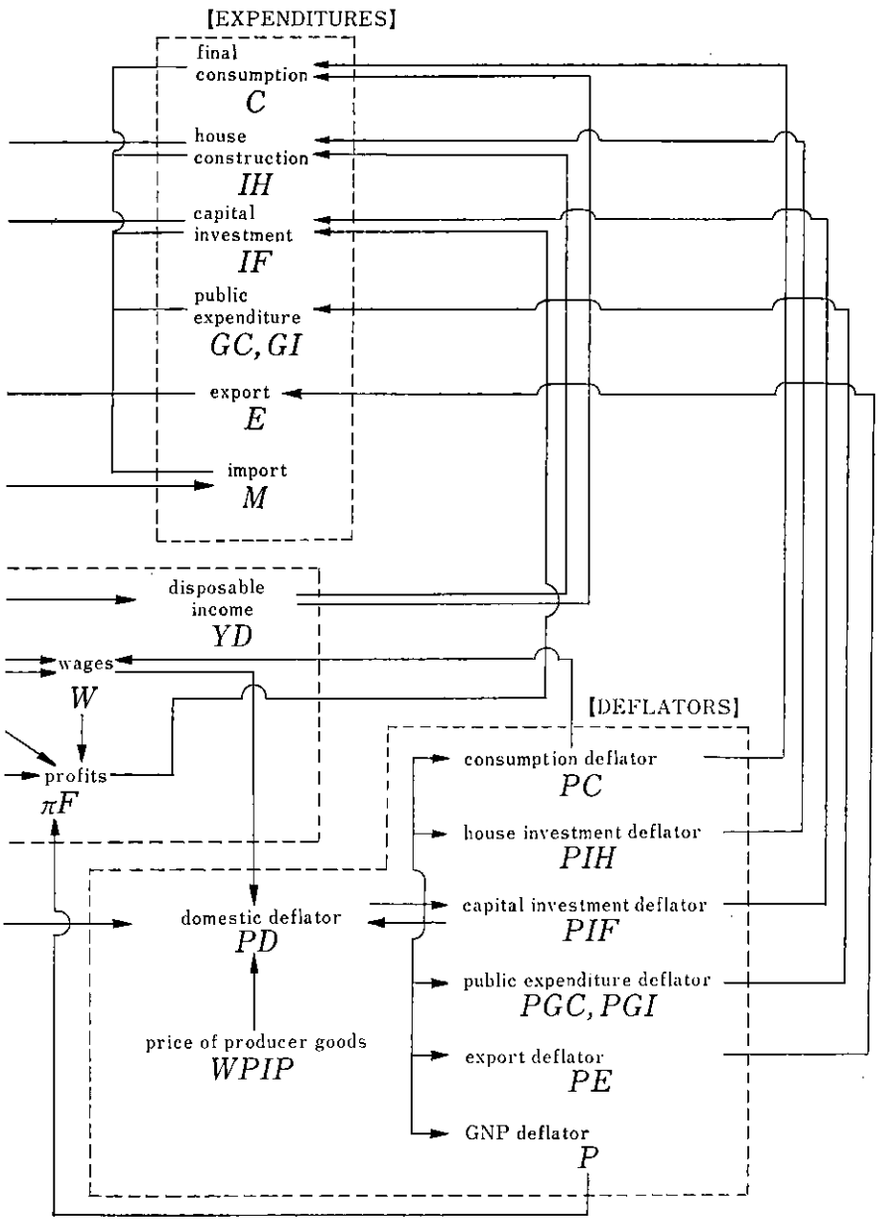
and their "households" were divided into "wage-earning households" and "non-wage earning households", which are households with compensation for executives, with real property income, and income of self-employed.

3.2 Other Characteristics

Other characteristics of the MESO model are as follows. First, the MESO model is a Keynesian-type demand-side model. And the flow-chart of the model is showed in Fig. 2.

Second, the MESO model uses "converters" to divide the demand among different-scale businesses. It is necessary to convert each demand item, which are decided by the functions of consumption, investment, international trade, etc., into demand for businesses of different scales. For the purpose, the MESO model prepares "converters" calculated by using input-output tables.

Our MESO model, with the above-mentioned characteristics, has a simultaneous



equation structure with 98 endogenous variables and 35 exogenous variables (excluding dummy variables). It is a model which includes 48 structural equations and statistical equations along with 50 definitional equations, which uses the new SNA as its data base, and covers the period between fiscal 1965–1979 in annual terms.

3.3 Behavior of Households

In this section, we will examine the consumption and housing construction functions which reflect the different behavioral patterns of various households.

First, we must consider the fact that the propensity to consume of each social stratum is distinctly different. Therefore, in our consumption equation (1) (this equation number is in the equation list of APPENDIX), we have adopted real wage income (YD_w/P_c) and real non-wage income (TD_c/P_c) as 2 different explaining-variables. Nonetheless, we must note that this division has slight theoretical discrepancy from the division between wage income earners and non-wage income earners, since "non-wage income" include to a partial extent items such as interest income which can be received by wage income earners=workers as well. Furthermore, our category of "non-wage income" covers the income of the self-employed including farmers. The propensity to consume of these self-employed are low, although they are not necessarily high income earners, because of the instability of their income and their high saving ratio for investment purposes[8].

Equation (2) is the housing construction function of households (include personal enterprises). Here, since the number of houses built for rental purposes by personal enterprises is overwhelmingly low compared to the number of houses built by households for their own living purposes, we can assume this equation to be one for houses possessed for their own residential purposes. Table 2 shows the house possession

Table 2. Capital Raising for Fixed Investment (manufacturing).

scale of enterprises	big businesses			small businesses	little businesses
fiscal year	average of 1967–73	average of 1975–79	1981	1981	1981
amount of investment	100.0	100.0	100.0	100.0	100.0
equity capital	30.2	72.5	77.5	32.5	29.7
borrowings	69.8	27.5	22.5	67.5	70.3

source: *Short-term Economic Survey of Principal Enterprises* (Bank of Japan)
Survey of Intensions by the Manufacturing Enterprises to Investment (Small Businesses Finance Corporation)
Survey of Small Business Investment (People's Finance Corporation)

* 'Big business' is 'principal enterprise' on the survey by The Bank of Japan.
'Small business' is on the survey by Small Business Finance Corporation.
'Little business' is on the survey by People's Finance Corporation.
The data of 1981 is by H. Kuroda "Sensitive Responce to Business Conditions—Investments by Small and Little Businesses" (in Japanese) (*The Nihonkeizaishinbun*, 1982.4.10)

8) Refer to I. Friend and I.B. Kravis, "Enterpreneurial Income, Saving and Investment", *American Economic Review*, Vol. XLVII, No. 3, 1957.

relationship of various social strata, and we can observe a great difference in the ratio of houses owned by the general working class and houses owned by the corporate executives/self-employed class. Therefore, the percentage of income used for building their own houses for general workers is low, whereas that for the executives and self-employed is high. Consequently, in order to reflect the difference in the income spending attitudes of various social strata, we have adopted real wage income (YD_w/P_c) and real non-wage income (YD_c/P_c) as two different explaining variables. However, here again, we must note that the division between wage income and non-wage income is slightly discrepant from the division between wage income earners and non-wage income earners.

The parameter of the consumption function, which can be deduced from the above specification, is $0.83-0.49=0.34$ greater for wage income, and the parameter of housing construction function is $0.18-0.09=0.09$ greater for non-wage income. If we sum up the consumption expenditure and the housing construction expenditures for the households, the parameter of wage income becomes $0.83+0.09=0.92$, and the parameter of non-wage income becomes $0.49+0.18=0.67$; thus, the former is greater than the latter by $0.92-0.67=0.25$. This show that as a total the general worker's propensity to spend income is greater, and therefore that the redistribution of income from corporate executives or property income earners to general workers is effective for the expansion of the total demand.

3.4 Behavior of Enterprises

a) Decision of Investment

As for the explaining variables for equipment investment, we have basically adopted this period's or the previous period's profit after tax and before dividends, which was deflated by the equipment investment deflator. Also, since borrowings from financial institutions can perform the same function as investment funds, we have added to the above profit, the amount of borrowings if it was estimated to be significant, and made it an explainig-variable.

First of all, "the 1982 Economic White Paper of Japan" states that the equipment investment behavior of enterprises have slowed down as of 1974, the year of the First Oil Shock. We measured this shrinkage in investment attitudes by using our data on equipment investment, but we are able to see a significant change only in the behavior of big businesses during the period of the First Oil Shock. And, for the big businesses' equipment investment function: equation (3), an explaining-variable which added the borrowings to the profit was found to be significant for the period before the First Oil Shock, but it was not estimated to be significant for the period after the oil shock. This seems to have reflected the abundance of the big businesses' internal funds after the First Oil Shock, because these businesses had carried out the "rationalization" (equals reduction in the number of workers) as well as moderation in investments (see Table 2).

Next, if we look at the reaction-coefficients against the "profit" in Eqs. (3) (4)

(6), they become greater in the order of big businesses, small businesses, and personal enterprises after 1975. This shows that equipment investment of personal enterprises and small businesses responded well to the current state of businesses conditions, and this can be attributed to the fact that: (1) small businesses gestation period for equipment investment is short; (2) their amount of investment is small; (3) they are positioned in an area closer to total demand, etc. Additionally, personal enterprises and small businesses have a higher dependency ratio on loaned money for their capital (Table 2). Therefore, even after they have invested in equipment, good sales and a good profit environment remain important conditions for their investment, and as a result, they become more sensitive to the state of business conditions.

However, it is not sufficient to explain the above differences in reaction-coefficients against "profits" as a mere result of the differences in their sensitivity to the state of business conditions. Many small businesses are under the direct control of big businesses through subcontractual or group relationships, but big businesses treat the small businesses as their "safety valve" to overcome the business fluctuations occurring during a business cycle. Consequently, the equipment investment of small businesses and personal enterprises fluctuate substantially. Also, since tax has already been deduced from their respective "profits", the difference in the reaction-coefficients means that there is also a difference in the effects of corporate taxation. More specifically, the effect of an equal amount of enterprise tax on the businesses becomes greater in the order of big businesses, small businesses, and personal enterprises; and in this sense, a policy of tax reduction for personal enterprises and small businesses, along with a tax increase for big businesses for the same amount, will lead to a positive restructuring of the whole economy.

In addition, the "demand growth rate" was found to be significant as an explaining variable of equipment investment of "other enterprises" rather than "profit", and this shows that demand is a more important deciding factor than "profit" when investment decisions are made by public institutions.

b) Decision of Demand for Each Business Group

The demand items, deduced from Eqs. (1)–(12), have to be converted into demand for businesses of different sizes. This can be done by using a method which calculates the demand of each group as statistical equations or a method which estimates a converter using input-output tables. Here, we have used the latter method for our MESO model. For the converter, since the demand for each business group is decided by the demand item, the influence that the fluctuations in each demand item have over the demand for different size businesses will vary according to the difference in each demand item's coefficient. First, if we compare the coefficient of total private investment (IF plus IH) with the coefficient of individual consumption expenditure (C), the former coefficient is greater for big businesses and while the latter coefficient is greater for personal enterprises. Secondly, if we compare the export (E) coefficient and the import (M) coefficient, the former coefficient is greater for big businesses while the latter coefficient is greater for personal enterprises and small businesses. In short, the smal-

ler the size of the business, the greater the benefit that is derived from a consumption-led, domestic demand-led economic structure; the larger the size of the business, the greater the benefit that is derived from an investment-led, external demand-dependent economic structure. Therefore, as the economic structure leans toward a consumption decrease and export dependency as in recent years, the economy limps along, i.e., frequent bankrupcies of small businesses occur whereas big businesses show good results.

c) Decision of Stock Fluctuations

Stock fluctuations include parts of both "desired inventories" and "undesired inventories". Among these equations, the performance of the Eqs. (17), (18) and (20) estimated as structural equations was poor for small businesses and other enterprises, and their coefficients of determination revised by degree of freedom (D.F.) were 0.623 and 0.692. This reflects the fact that while the major part of the stock fluctuations of big businesses is "desired inventory investment", the stock fluctuations of the small businesses and other enterprises include mostly "undesired inventories" due to their difficulty in predicting future demand. Especially, the inability to explain the stock fluctuations of personal enterprises by inventory investment function may be attributable to the fact that personal enterprises cannot engage in production on the basis of their future demand. Consequently, we have deduced stock fluctuations of personal enterprises as the difference between the production amount, calculated by Eq. (24), and the demand. (see Eq. (19))

d) Decision of Labor Demand

The amount of labor employment depends on the businesses' decision on the amount of labor demand, which is based on their judgement of the commodity market condition. Subsequently, the most important explaining variable in the labor demand functions is the production amount of the different business strata. Additionally, since a certain substitution exists between capital equipment and labor force in productive activities, we also adopted the amounts of capital equipment of each business stratum as the explaining variables. However, the amount of capital equipment was not estimated to be significant as an explaining variable in the small businesses labor demand function; Eq. (30), and this reflects the fact that small businesses have a labor intensive tendency, and that the substitution between investment and labor in these businesses is insufficient.

There is a difference in the employment decision attitudes among the various business strata, and employment adjustments of big businesses are more fixed than those of small businesses. The reason for this may be that in big businesses, 1) the life-time commitment system is more established; 2) necessary expences for employment arrangements such as the preparation and distribution of company pamphlets, school visits, and recruitment meetings are larger; 3) labor unions have more negotiating power.

The deduced labor demand function is well in agreement with the above presumption. The parameter showing the employment inducement effect of "production" increases in the order of big businesses (0.02), other enterprises (0.05), and small businesses (0.18). This also supports the observation that small businesses are more affected

by cyclical fluctuations. In addition, the employment in the previous period was estimated significantly only in big businesses, again showing the stability of employment in big businesses. From the differences in employment inducement effects as explained above, we can conclude that production increases in small businesses are more helpful than production increases in big businesses for short-term employment increases.

Equation (32) is the function for the number of farmers. The explainig variable "agricultural price/wage (PA/W)" shows one feature of the Japanese agriculture, i.e., the fact that many farmers are abandoning their occupation as a result of their judgements of "whether employees or self-employed farmers earn more money?" We could not find a suitable function form for non-agricultural self-employed workers. This is because personal enterprises include many latent surplus-population, and hence undergo more complex fluctuations.

e) Decision of Wages

Each business stratum has a different decision pattern of wages. Now, we can assume the following relationship.

personal expenses per capita (wage)	=	labor's relative share	× labor productivity of value added (solvency condition)

Namely, wage is the product of the solvency conditions and the labor's relative share showing the businesses' attitude in solvency. Accordingly to an analysis, the labor's relative share is higher for small businesses—small businesses 54.8%, big businesses 44.2%, which means that the wages of small businesses are affected more by the solvency condition. Actually, even in our own estimations using formulas (40), (41) and (44), the parameter of real labor productivity of value-added increased in the order of big businesses (0.60), small businesses (0.82), and personal enterprises (0.87), which consists with the results of the above analysis.

Also, in these 3 equations, the parameter of the previous period's wage is smaller for small businesses (0.21), and personal enterprises (0.29) than for big businesses (0.46). This again displays the wage stability of big businesses and wage instability of small businesses and personal enterprises against cyclical fluctuations. Equations (42) and (43) explain the executive's salary. Here, the significance of each social stratum's labor wage and labor productivity of value-added as an explaining variable shows how the executive's salary is decided by sliding it with the worker's wage, and how businesses increase their salary payments according to the performance of their institution.

3.5 Results of the Final Test

Table 3 shows the unequality coefficients[9] of the final test during the 5 year from

9) U.E.C. (Unequality coefficient)

$$=\left(\sqrt{\sum_{t=T_0}^{T_1}(\text{observation}-\text{estimation})^2}\Big/\sqrt{\sum_{t=T_0}^{T_1}\text{observation}^2}\right)\times 100.$$

where T_0 is the starting point in final test, and T_1 is the ending point.

Table 3. Results of the Final Test.

variables	U.E.C.	variables	U.E.C.	variables	U.E.C.
Y	4.56	πF_b	63.18	K_n	3.32
Y_b	3.08	πF_s	123.01	K_{bn}	1.39
Y_s	6.69	πF_o	58.34	K_{sn}	3.05
Y_o	10.66	π_{ia}	18.07	K_{on}	2.07
Y_{ia}	12.65	WNW	4.47	K_{ia}	6.49
D	1.96	W	1.99	KH	1.64
D_b	3.71	W_b	4.59	YD	6.36
D_s	3.96	W_s	2.17	YD_w	4.49
D_o	7.26	WC_b	3.44	YD_c	10.75
D_{ia}	3.00	WC_s	2.82	DEP	4.14
IF	7.38	W_o	9.38	DEP_b	3.13
IF_b	3.58	W_i	16.49	DEP_s	5.80
IF_s	11.85	N	2.19	DEP_o	7.60
IF_o	14.08	NW	2.97	DEP_{ia}/PIF	6.29
IF_{ia}	13.67	NW_b	0.93	$YDIV$	11.01
IH	4.52	NW_s	4.00	DIV_b	1.96
C	6.33	NW_o	19.38	DIV_s	14.91
M	7.35	Na	1.24	DIV_o	12.48
E	13.76	UR	72.46	P	3.23

Variable name is in the list of appendix.
'U.E.C.' is unequality coefficients.

fiscal 1975 to 1979.

As a whole, we can first of all conclude that the performance of the variables for big businesses is good. This can be ascribed to the general stability of the big businesses' activities and the rationality of their behavior patterns. On the other hand, the performance of unequality coefficients of such variables as $\pi F_b \sim \pi_{ia}$ or UR are bad, because these variables are calculated as remainders. (see Eqs. (58), (59), (60), (37)) Nontheless, the performance of the macroeconomic variables are especially good. Also, most of the unequality coefficients of other variables fit within the range of 10%, and therefore, we can consider that the MESO model has passed its test as a model for policy analysis.

IV Various Policies and their Effects on Different Social Strata

In this section, we will survey the effects of various policies on the different social strata using the MESO model.

4.1 Effects of Public Construction and Export-Import Conversion

Table 4 shows the effects of the governments' construction expenditure (nominal) being increased by 100 billion yen over the actual expenditure yearly since 1975. Also,

Table 4. Effects of a Sustained 100 Billion Yen Increase of Public Constructions. (deviation from the solution at the final test)

variables	fiscal year	1975	1976	1977	1978	1979	average
real gross product	(billion yen)	124.8	222.1	251.4	213.4	198.6	202.1
real product by big businesses	(billion yen)	4.7	24.9	32.2	34.3	2.4	25.7
real product by small businesses	(billion yen)	101.2	166.6	155.6	124.4	104.2	130.4
real product by other enterprises	(billion yen)	6.4	26.0	30.1	25.9	5.8	18.8
real product by personal enterprises	(billion yen)	8.3	26.3	34.2	34.2	29.3	26.5
real personal consumption	(billion yen)	52.9	117.4	135.7	127.2	114.1	109.5
real housing construction by households	(billion yen)	7.9	18.9	19.9	18.2	15.7	16.1
real investment by big businesses	(billion yen)	1.7	6.1	8.7	10.1	13.7	8.1
real investment by small businesses	(billion yen)	23.0	35.0	39.2	39.4	52.1	37.7
real investment by other enterprises	(billion yen)	5.2	8.0	14.2	16.9	19.9	12.8
real investment by personal enterprises	(billion yen)	5.5	12.9	17.6	18.9	24.7	15.9
disposable income of wage-earning	(billion yen)	69.5	163.3	219.2	250.0	272.6	194.9
disposable income of nonwage-earning	(billion yen)	30.0	84.6	130.4	157.8	184.5	117.4
compensation for employees	(billion yen)	77.2	179.9	240.5	272.3	315.1	217.0
profit of big businesses (before taxes)	(billion yen)	7.1	35.3	53.3	65.7	69.7	46.2
profit of small businesses (before taxes)	(billion yen)	50.5	101.7	115.3	126.2	110.7	100.9
profit of other enterprises (before taxes)	(billion yen)	7.4	29.1	41.4	46.0	46.9	34.2
business surplus of self-employed	(billion yen)	16.2	59.2	33.0	115.2	119.0	68.5
nominal wage of big businesses	(10,000 yen)	0.06	0.25	0.45	0.60	0.73	0.42
nominal wage of small businesses	(10,000 yen)	0.13	0.31	0.45	0.46	0.54	0.38
nominal wage of other enterprises	(10,000 yen)	0.04	0.06	−0.14	−0.77	−1.79	−0.52
nominal wage of personal enterprises	(10,000 yen)	0.07	0.24	0.40	0.47	0.52	0.34
real wage rate	(10,000 yen)	0.05	0.10	0.11	0.05	0.02	0.07
labor engaged	(thousand persons)	18.7	34.3	37.6	36.7	35.5	32.5
employees of big businesses	(thousand persons)	0.2	1.1	2.5	3.9	5.1	2.6
employees of small businesses	(thousand persons)	17.9	29.5	27.5	22.0	18.4	23.1
employees of other enterprises	(thousand persons)	0.9	4.5	8.4	10.9	10.7	7.1
GNP deflator	(percent)	0.0	0.0	0.2	0.3	0.3	0.2

Table 5. Effects of a Sustained 100 Billion Yen Decrease of Exports and a Sustained 100 Billion Yen Increase of Imports, Simultaneously. (deviation from the solution at the final test)

variables	fiscal year	1975	1976	1977	1978	1979	average
real gross product	(billion yen)	1.9	5.3	5.7	2.5	12.8	5.6
real product by big businesses	(billion yen)	−0.6	−2.9	−2.5	−2.7	−2.6	−2.3
real product by small businesses	(billion yen)	2.0	3.5	2.8	0.2	8.5	3.4
real product by other enterprises	(billion yen)	0.5	1.1	1.8	1.7	1.3	1.3
real product by personal enterprises	(billion yen)	1.4	3.1	0.7	3.1	3.5	2.4
real personal consumption	(billion yen)	1.2	3.3	3.3	1.4	9.1	3.7
real housing construction by households	(billion yen)	0.3	0.5	0.6	−0.1	1.9	0.6
real investment by big businesses	(billion yen)	−0.2	−0.4	−0.4	−0.4	−1.0	−0.5
real investment by small businesses	(billion yen)	−0.2	0.8	0.2	−0.4	5.1	1.1
real investment by other enterprises	(billion yen)	0.2	0.5	0.4	0.2	0.0	0.3
real investment by personal enterprises	(billion yen)	0.2	1.1	0.9	0.6	3.7	1.3
disposable income of wage-earning	(billion yen)	1.8	3.1	3.5	1.6	7.1	3.4
disposable income of nonwage-earning	(billion yen)	0.8	4.3	3.8	2.3	13.5	4.9
compensation for employees	(billion yen)	1.1	3.6	3.7	1.9	9.0	3.9
profit of big businesses (before taxes)	(billion yen)	−0.3	−2.1	−1.7	−2.1	4.4	−0.4
profit of small businesses (before taxes)	(billion yen)	1.6	1.3	0.1	−2.3	14.2	3.0
profit of other enterprises (before taxes)	(billion yen)	−0.3	0.5	−0.1	−0.6	7.1	1.3
business surplus of self-employed	(billion yen)	1.6	3.3	3.2	1.7	10.2	4.0
nominal wage of big businesses	(10,000 yen)	0.0	0.0	0.0	0.0	0.0	0.0
nominal wage of small businesses	(10,000 yen)	0.0	0.0	0.0	0.0	0.0	0.0
nominal wage of other enterprises	(10,000 yen)	0.0	0.0	0.0	0.0	0.0	0.0
nominal wage of personal enterprises	(10,000 yen)	0.0	0.0	0.0	0.0	0.0	0.0
real wage rate	(10,000 yen)	0.0	0.0	0.0	0.0	0.0	0.0
labor engaged	(thousand persons)	0.4	0.6	0.4	−0.1	1.4	0.5
employees of big businesses	(thousand persons)	0.0	−0.1	−0.1	−0.1	−0.1	−0.1
employees of small businesses	(thousand persons)	0.4	0.6	0.5	0.0	1.5	0.6
employees of other enterprises	(thousand persons)	0.1	0.1	0.1	0.0	0.0	0.1
GNP deflator	(percent)	0.0	0.0	0.0	0.0	0.0	0.0

the effects on each of the business strata of public construction is large among the small-sized businesses. This happens because, our analysis relies on the value of the converter which allocates the final demand into each of the business strata. In Eqs. (13)–(15), the parameter of GI for big businesses, small businesses, and personal enterprises, are 0.18, 0.57, and 0.09, respectievly. The reason why small businesses are affected more by this policy is that much of the construction industry, which is deeply related to public construction, is composed of small corporations, and that public construction orders are gradually changing for small businesses.

Next, Table 5 shows the results of a simulation in which both exports and imports were decreased simultaneously by 100 billion yen each without changing the balance of payments. We are prone to exports in which the gross demand remains unchanged since exports and imports are both decreased by the same amount. However, contrary to expectation, the gross demand and gross product both increase for every year. This results from the difference in the repercussion effect on exports and imports of each business stratum. In other words, the import-export coefficients in Eqs. (13)–(15), which decide the total demand for each business stratum, is greater for exports by $0.265-0.229=0.036$ among big businesses, greater for imports by $0.481-0.477=0.004$ among small businesses, and greater for imports by $0.097-0.075=0.022$ among personal enterprises. Therefore, a decrease in exports and imports for the same amount operates positively on small businesses and personal enterprises, and acts negatively on big businesses. This is due to fact that many of the big businesses depend more on exports while many of the small businesses or personal enterprises depend more on domestic demand.

According to the tables, if the economy moves in a direction favorable to small businesses or personal enterprises, the effects of increased employment and wages among the small businesses and personal enterprises exceeds the effects of decreased employment and wages among the big businesses, and compensation for employees increases as a whole. Also, at the same time, the effects of increased investment among the small businesses and personal enterprises exceeds the effects of decreased investment among big businesses; thus, gross investment increases as a whole. The increase in real gross product is due to such overall increases in gross demand.

Now, one important characteristic of the Japanese economy in recent years, especially since the Second Oil Shock, is the drastic reduction of public construction and the increase in export dependency under the "fiscal crises"; and the above analysis shows that such economic conditions, although relatively beneficial for big businesses, give a hard blow to small businesses and personal enterprises. Consequently, it becomes the source of "economic limping".

4.2 Effects of Reduction in Wage Income Tax and Increase in Property Income Tax/Executive Salary Tax

We have carried out a simulation of what will happen if a one trillion yen reduction in wage income tax and a one trillion yen increase in property income tax and execu-

tives income tax are enforced. The results are shown in Table 6.

If such policies are exacted, the total household's disposable income does not change at the 1st stage, but as we stated in 3.1 of the last section, total consumption (including housing buildings) will increase, due to the difference in the propensities to consume between wage income earners and non-wage income earners. This may lead to an upturn in the economy as a whole. Here, since the increase in consumption is leading the way in this case, the expansion is prominent among small businesses which are more closely related to consumption.

4.3 Effects of Corporate Tax Reduction for Small Businesses and Corporate Tax Increase for Big Businesses

We have carried out a simulation of what happens if a tax increase of 1 trillion yen for big businesses and a tax reduction of 1 trillion yen for small businesses are practiced simultaneously. The results are shown in Table 7. In case such a policy is to be practiced, the profits after tax for all groups of businesses remain unchanged during the first stage. However, total investment increases due to the difference in investment reaction-coefficients against profits after tax between big businesses and small businesses. As seen in Table 7, the investment increase in small businesses exceeds the investment decrease of big businesses. Especially, the high employment inducement effect and the wage increase effect of small businesses create an effect of "increased household disposable income on increased consumption", and also from this aspect, gross demand increases.

By the way, let us now summarize the effects of household tax and enterprise tax. Table 9 is a summary of the influence of types of taxes on GNP, including the effects of returned income tax on personal enterprises. Here the negative effects on GNP decrease in the order of returned income tax on personal enterprises, wage income tax, non-wage income tax, corporate tax on small businesses, and corporate tax on big businesses. Among these taxes, the effects of taxes on personal enterprises is particularly significant. This is because these taxes reduce not only the investment of personal enterprises but also disposable income of non-wage income earners (YD_c). This effect has never been analyzed before we used the MESO model which incorporates the peculiar investment behavior of personal enterprises.

4.4 Effects of Conversion of Governments' Order from Big to Small Businesses

Today, as budget cuts are increasingly being practiced, it becomes important to identify who received the orders for these reduced public expenditure projects. Therefore, we assumed a transfer of 1 trillion yen order-placements from for big businesses to small businesses. And the computed results are shown in Table 8.

On the 5 year average, the production of small businesses increased by 1.47 trillion yen while the production of big businesses decreased by 0.6 trillion yen. This by itself increases gross production, but if the production increases of personal enterprises and other enterprises are added to this figure, gross production will increase by 1.3 trillion

Table 6. Effects of a Sustained One Trillion Yen Reduction of Taxes on Wage Income and a Sustained One Trillion Yen Increase in Taxation on Non-wage Income, Simultaneously. (deviation from the solution at the final test)

variables	fiscal year	1975	1976	1977	1978	1979	average
real gross product	(billion yen)	200.7	486.5	521.4	433.4	381.0	404.6
real product by big businesses	(billion yen)	5.1	35.8	56.7	57.2	51.7	41.3
real product by small businesses	(billion yen)	133.3	308.9	300.5	214.0	129.8	217.3
real product by other enterprises	(billion yen)	14.0	76.0	91.2	76.4	23.8	56.2
real product by personal enterprises	(billion yen)	16.9	64.6	78.5	73.8	62.0	59.2
real personal consumption	(billion yen)	359.8	524.9	546.5	510.4	473.4	483.0
real housing construction by households	(billion yen)	− 92.6	− 19.1	− 32.3	− 33.7	− 39.4	− 43.4
real investment by big businesses	(billion yen)	4.5	8.9	15.7	20.7	30.9	10.3
real investment by small businesses	(billion yen)	38.6	64.1	72.9	81.4	115.0	74.4
real investment by other enterprises	(billion yen)	14.8	13.9	23.6	32.1	32.8	23.4
real investment by personal enterprises	(billion yen)	19.0	28.3	35.8	43.3	59.1	37.1
disposable income of wage-earning	(billion yen)	1,150.0	1,329.9	1,446.7	1,490.8	1,468.4	1,378.2
disposable income of nonwage-earning	(billion yen)	−930.2	−859.0	−777.5	−712.1	−652.4	−786.2
compensation for employees	(billion yen)	185.2	376.7	500.7	567.6	665.2	459.1
profit of big businesses (before taxes)	(billion yen)	9.6	51.2	101.0	126.6	135.6	84.8
profit of small businesses (before taxes)	(billion yen)	45.7	174.9	228.9	234.0	160.3	168.8
profit of other enterprises (before taxes)	(billion yen)	53.3	121.0	169.4	199.3	242.6	157.1
business surplus of self-employed	(billion yen)	39.1	21.7	194.5	228.0	243.1	145.3
nominal wage of big businesses	(10,000 yen)	0.29	0.51	0.87	1.15	1.37	0.84
nominal wage of small businesses	(10,000 yen)	0.36	0.62	0.82	0.91	0.99	0.74
nominal wage of other enterprises	(10,000 yen)	0.27	0.38	− 0.05	− 1.57	− 4.27	− 1.05
nominal wage of personal enterprises	(10,000 yen)	0.24	0.60	0.90	1.03	1.08	0.77
real wage rate	(10,000 yen)	− 0.01	0.25	0.24	0.14	0.16	0.16
labor engaged	(thousand persons)	25.3	63.5	74.9	70.5	59.2	54.2
employees of big businesses	(thousand persons)	0.3	1.9	4.6	7.6	10.1	4.9
employees of small businesses	(thousand persons)	23.6	54.7	53.1	37.8	23.0	38.4
employees of other enterprises	(thousand persons)	2.5	9.5	19.1	25.5	25.0	16.3
GNP deflator	(percent)	0.1	0.1	0.3	0.6	0.7	0.4

Table 7. Effects of a Sustained One Trillion Yen Reduction of Taxes on Small Businesses and a Sustained One Trillion Yen Increase in Taxation on Big Businesses, Simultaneously. (deviation from the solution at the final test)

variables	fiscal year	1975	1976	1977	1978	1979	average
real gross product	(billion yen)	39.2	111.3	109.3	103.6	100.7	92.8
real product by big businesses	(billion yen)	1.6	8.6	13.2	14.9	14.8	10.6
real product by small businesses	(billion yen)	32.1	63.3	68.7	56.7	44.6	53.1
real product by other enterprises	(billion yen)	2.2	9.6	13.8	14.1	9.9	9.9
real product by personal enterprises	(billion yen)	2.8	9.5	14.4	15.3	13.9	11.2
real personal consumption	(billion yen)	17.0	47.0	63.4	65.7	58.3	50.3
real housing construction by households	(billion yen)	2.6	6.9	8.8	8.1	6.9	6.7
real investment by big businesses	(billion yen)	−204.1	−190.3	−197.4	−193.0	−194.8	−195.9
real investment by small businesses	(billion yen)	242.8	233.9	232.5	239.1	243.9	238.4
real investment by other enterprises	(billion yen)	1.7	10.6	14.1	15.7	15.8	11.6
real investment by personal enterprises	(billion yen)	1.4	4.6	6.6	7.8	9.4	6.0
disposable income of wage-earning	(billion yen)	22.7	65.9	95.5	105.1	108.0	79.4
disposable income of nonwage-earning	(billion yen)	9.7	30.7	46.9	54.8	61.5	40.7
compensation for employees	(billion yen)	24.7	73.0	104.4	117.1	122.2	88.3
profit of big businesses (before taxes)	(billion yen)	2.7	31.1	53.3	68.1	77.3	46.5
profit of small businesses (before taxes)	(billion yen)	17.2	−0.3	−24.1	−65.1	−94.0	−33.3
profit of other enterprises (before taxes)	(billion yen)	2.1	10.0	15.5	18.3	18.4	12.9
business surplus of self-employed	(billion yen)	5.9	21.0	33.8	37.4	31.8	26.0
nominal wage of big businesses	(10,000 yen)	0.02	−0.10	−0.46	−1.22	−2.49	−0.85
nominal wage of small businesses	(10,000 yen)	0.04	0.11	0.16	0.16	0.16	0.13
nominal wage of other enterprises	(10,000 yen)	0.0	0.01	0.05	0.15	0.50	0.14
nominal wage of personal enterprises	(10,000 yen)	0.02	0.09	0.16	0.18	0.20	0.13
real wage rate	(10,000 yen)	0.01	0.02	0.01	−0.05	−0.08	−0.02
labor engaged	(thousand persons)	6.2	17.4	27.1	35.0	43.8	26.0
employees of big businesses	(thousand persons)	0.1	5.0	13.2	23.9	35.9	15.6
employees of small businesses	(thousand persons)	5.7	10.2	12.1	10.0	7.9	9.2
employees of other enterprises	(thousand persons)	0.5	1.8	1.8	0.8	−1.3	0.7
GNP deflator	(percent)	0.0	0.0	0.1	0.1	0.1	0.1

Table 8. Effects of a Sustained One Trillion Yen Conversion of Governments' Order from Big Businesses to Small Businesses. (deviation from the solution at the final test)

variables	fiscal year	1975	1976	1977	1978	1979	average
real gross product	(billion yen)	1,839.0	2,173.8	1,606.4	712.4	148.4	1,296.0
real product by big businesses	(billion yen)	−159.1	−702.3	−673.6	−720.2	−792.1	−609.5
real product by small businesses	(billion yen)	1,760.3	1,637.6	1,821.4	1,234.7	873.8	1,465.0
real product by other enterprises	(billion yen)	44.1	324.6	240.0	188.7	109.4	181.4
real product by personal enterprises	(billion yen)	61.7	213.4	220.8	138.8	40.7	135.1
real personal consumption	(billion yen)	781.5	1,244.2	1,007.0	538.5	40.4	722.3
real housing construction by households	(billion yen)	103.0	185.8	119.2	48.1	−12.4	88.7
real investment by big businesses	(billion yen)	−8.2	−81.9	−60.7	−68.5	−81.9	−60.2
real investment by small businesses	(billion yen)	410.4	460.4	370.9	245.6	138.0	325.1
real investment by other enterprises	(billion yen)	48.0	89.0	118.5	102.3	73.4	86.2
real investment by personal enterprises	(billion yen)	61.1	93.4	82.1	47.4	−19.8	52.8
disposable income of wage-earning	(billion yen)	668.3	64.9	139.0	181.4	174.9	245.7
disposable income of nonwage-earning	(billion yen)	382.5	718.0	717.3	455.4	134.5	482.3
compensation for employees	(billion yen)	1,210.9	1,833.2	1,528.2	846.5	109.7	1,105.7
profit of big businesses (before taxes)	(billion yen)	−83.4	−397.3	−260.6	−276.7	−355.3	−274.7
profit of small businesses (before taxes)	(billion yen)	760.4	1,173.7	798.0	376.7	119.7	501.9
profit of other enterprises (before taxes)	(billion yen)	76.8	192.0	177.6	119.7	13.8	116.0
business surplus of self-employed	(billion yen)	123.6	421.8	432.7	265.6	9.9	250.7
nominal wage of big businesses	(10,000 yen)	−0.48	−3.92	−5.38	−6.49	−8.42	−4.94
nominal wage of small businesses	(10,000 yen)	2.26	3.95	3.69	2.52	1.73	2.83
nominal wage of other enterprises	(10,000 yen)	0.40	0.70	0.70	2.59	10.26	2.93
nominal wage of personal enterprises	(10,000 yen)	0.63	1.93	2.36	1.81	0.91	1.53
real wage rate	(10,000 yen)	0.66	0.87	0.72	0.27	−0.45	0.41
labor engaged	(thousand persons)	313.8	440.6	325.9	171.0	77.0	265.7
employees of big businesses	(thousand persons)	−2.7	−15.5	−12.5	−29.4	−38.8	−19.8
employees of small businesses	(thousand persons)	311.5	435.3	322.3	200.8	154.6	284.9
employees of other enterprises	(thousand persons)	10.3	33.3	31.8	1.6	−34.4	8.5
GNP deflator	(percents)	0.4	0.5	0.7	0.5	0.1	0.2

Table 9. Effects on Real GNP by 100 Million Yen Increase in Taxation.
(billion yen)

kinds of taxes \ fiscal year	1975	1976	1977	1978	1979	average
tax on personal enterprises	−124.8	−327.6	−355.9	−384.8	−213.8	−281.4
personal tax on wage income	− 94.2	−197.6	−201.3	−163.6	−143.3	−160.0
personal tax on non-wage income	− 74.1	−148.9	−149.2	−120.3	−105.2	−119.5
corporate tax on small businesses	− 29.7	− 66.6	− 74.9	− 64.7	− 60.2	− 59.2
corporate tax on big businesses	− 25.8	− 57.5	− 64.0	− 54.3	− 50.1	− 50.3

yen on the 5-year average. This is because, as explained before, the investment inducement effect by profits and the employment/wage inducement effect of small businesses is greater than those of big businesses.

4.5 Effects of Employment Regulation

The basis of a policy for increasing or securing employment is the expansion of production through increases in demand, etc. However, on the other hand, in case of necessity, a policy of more directly increasing and maintaining employment by businesses can be used in conjunction with such policies. For example, legislation of dismissal regulations, employment regulations by agreements, increase of employment through reduction in working hours, reforms and active use of fringe benefit systems, promotion of employment of aged workers, women and disabled persons, perfection of employment exchange system and vocational training systems, and increase of employment in the public sectors, etc.

If the above measures are adopted, an additional increase in employment is possible. Here, personal consumption expenditure increases, but on the other hand, the increase in the businesses' total wage expenditure (wage per worker × number of workers employed) suppresses the profit, and therefore, equipment investment decreases. As a whole, these various relationships determine the increase or decrease in gross demand and gross production, but these effects differ for each business stratum.

Table 10 indicates the increases in real GNP induced by additional employment of 100 thousand workers to each businesses stratum's employment. Generally, it can be seen that while employment restrictions on other enterprises or big businesses raise

Table 10. Effects on Real GNP by Additional Employment of 100 Thousand Workers to Each Business Stratum.
(billion yen)

regulation-objects \ fiscal year	1975	1976	1977	1978	average
big businesses	64.3	176.4	199.6	102.2	135.6
small businesses	1.3	− 15.7	− 43.2	− 43.7	− 25.3
personal enterprises	−107.0	−257.6	−432.1	−332.0	−282.2
other enterprises	91.1	180.5	159.8	201.4	158.2

real national product, employment restrictions on small businesses or personal enterprises reduce the real national product. This is attributable to the difference in the degree to which profit reduction invites an investment reduction. Therefore, in order not to limit the effects of employment regulations to a mere increase in the number of employed workers, these regulations should be directed more specifically toward big businesses or public institutions, etc.

We must not forget that our model is a demand-sided short-term model. Therefore, our analyses have to be limited to short-term policy accessments, and we must not place too much confidence in the model simulations. Nevertheless, in the limits, our MESO model has many new important characteristics and can examine signifiacnt policy effects which have never been examined before. So, we believe the analyses which have carried out in this study are sufficient to indicate the importance of viewing various government policies through a different social class perspective.

MULTI-SECTORAL ECONOMETRIC-MODEL DIVIDED BY SOCIAL STRATUMS

Throughout this list the following definitions are used;

$\bar{R}^2$: Coefficient of Determination Revised by D.F.
DW: Durbin Watson Ratio
ln=natural logarithm of X $\quad \hat{X}=X/X_{-1}-1.0$
$(x-y)$ estimated period

Each figure in a parenthesis is a t-ratio of the corresponding estimate.

I FINAL DEMANDS

(1) Personal Consumption

$$C = \underset{}{8928.3} + \underset{(12.76)}{0.830}\,YD_w/PC + \underset{(2.734)}{0.487}\,YD_c/PC$$

$\bar{R}^2 = 0.994 \quad DW = 0.939 \qquad (1965\text{–}79)$

(2) Housing Construction by Households

$$IH = \underset{}{7412.4} + \underset{(5.593)}{0.087}\,YD_w/PC + \underset{(4.022)}{0.183}\,YD_c/PC - \underset{(3.310)}{9916.7}(PIH/P)_{-1}$$

$\bar{R}^2 = 0.982 \quad DW = 2.005 \qquad (1966\text{–}79)$

(3) Investment by Big Businesses

$$IF_b = \underset{}{3754.9} + \underset{(12.24)}{0.485}\{(\pi F_b + DEP_b + DIV_b - TF_b + FL_b)/PIF \times DUM6573\}_{-1} + \underset{(2.635)}{0.209}\{(\pi F_b + DEP_b + DIV_b - TF_b)/PIF \times DUM7579\} + \underset{(3.767)}{2657.1}DUM7579 + \underset{(3.168)}{1018.3}DUM70 - \underset{(1.014)}{139.5}(I - \hat{PIF})$$

$\bar{R}^2 = 0.938 \quad DW = 2.015 \qquad (1967\text{–}79)$

(4) Investment by Small Businesses

$$IF_s = \underset{(4.728)}{745.4} + 0.241(\pi F_s + DEP_s + DIV_s - TF_s + FL_s)/PIF + \underset{(6.819)}{0.101 D_s}$$

$\bar{R}^2 = 0.884 \quad DW = 2.426 \qquad (1965\text{–}79)$

(5) Investment by Other Enterprises

$$IF_o = \underset{(5.270)}{-3896.4} + 0.237 IF_{-1} + \underset{(2.447)}{5731.6}\hat{D}_o$$

$\bar{R}^2 = 0.696 \quad DW = 2.901 \qquad (1966\text{–}79)$

(6) Investment by Personal Enterprises

$$IF_{ia} = \underset{(16.11)}{-3451.0} + 0.456(\pi_{ia} + DEP_{ia} - TH_{ia})/PIF$$

$\bar{R}^2 = 0.949 \quad DW = 1.403 \qquad (1965\text{–}79)$

(7) Gross Capital Investment

$$IF = IF_b + IF_s + IF_o + IF_{ia}$$

(8) Export of Goods and Services

$$E = \underset{(11.22)}{-8263.8} + \underset{(1.547)}{190.6} WT + \underset{(3.124)}{0.0004}\frac{RATE \cdot PW}{PE} - 3447.4 DUM73$$

$\bar{R}^2 = 0.984 \quad DW = 1.716 \qquad (1965\text{–}79)$

(9) Import of Goods and Services

$$M = \underset{(5.218)}{-5548.3} + 0.192(C + GC) + \underset{(2.414)}{0.144}(IF + GI + IH)$$

$\bar{R}^2 = 0.984 \quad DW = 1.976 \qquad (1965\text{–}79)$

(10) Government Consumption

$$GC = GCN/PGC$$

(11) Government Investment

$$GI = GIN/PGI$$

(12) Gross Demands

$$D = C + IH + IF + GC + GI + E + ET - M - MT$$

(ET, MT, GCN, GIN=exogenous variables)

II DEMANDS FOR FOUR KINDS OF PRODUCERS

(13) Demands for Big Businesses

$$D = 3087.4 + 0.142C + 0.037GC + 0.184GI + 0.191(IF + IH) + 0.265E - 0.229M + 2595.6 DUM7172 + 4503.0 DUM78$$

(14) Demands for Small Businesses

$$D_s = -10935.6 + 0.467C + 0.092GC + 0.573GI + 0.549(IF + IH) + 0.477E - 0.481M$$

(15) Demands for Personal Enterprises

$$D_{ia} = 14475.0 + 0.113C + 0.016GC + 0.085GI + 0.093(IF + IH) + 0.075E - 0.097M$$

(16) Demands for Other Enterprises

$$D_o = D - D_b - D_s - D_{ia}$$

(17) Increase in Stocks of Big Businesses

$$J_b = 4784.7 - 0.813D_b + 0.680D_{b-1} + 2879.7DUM7374$$
$$(5.691) \quad (4.963) \quad (3.012)$$
$$\bar{R}^2 = 0.822 \quad DW = 1.016 \quad (1966\text{–}79)$$

(18) Increase in Stocks of Small Businesses

$$J_s = 40352.4 - 51683.9(S_s/Y_s) - 14352.8\hat{Y}_s - 4570.7DUM6572$$
$$(4.203) \quad (1.654) \quad (4.273)$$
$$\bar{R}^2 = 0.623 \quad DW = 1.706 \quad (1966\text{–}79)$$

(19) Increase in Stocks of Personal Enterprises

$$J_{ia} = Y_{ia} - D_{ia}$$

(20) Increase in Stocks of Other Enterprises

$$J_o = -726.2 - 19543.0(S_o/D_o) - 0.282D_o - 5328.7DUM7375$$
$$(4.793) \quad (3.509) \quad (3.424)$$
$$\bar{R}^2 = 0.692 \quad DW = 1.706 \quad (1965\text{–}79)$$

(21) Increase in Gross Stocks

$$J = J_b + J_s + J_o + J_{ia}$$

III PRODUCTION

(22) Product by Big Businesses

$$Y_b = D_b + J_b$$

(23) Product by Small Businesses

$$Y = D_s + J_s$$

(24) Product by Personal Enterprises

$$Y_{ia}/K_{ia} = -0.074 + 1.019\{D_{ia}/K_{ia} + (D_{ia}/K_{ia})_{-1}\}/2$$
$$(30.15)$$
$$\bar{R}^2 = 0.986 \quad DW = 1.359 \quad (1966\text{–}79)$$

(25) Product by Other Enterprises

$$Y_o = D_o + J_o$$

(26) Product by Non-agricultural Personal Enterprises

$$Y_i = Y_{ia} - Y_{an}/P$$

(27) Gross Domestic Product

$$Y = Y_b + Y_s + Y_{ia} + Y_o$$

(28) Productive Capacity

$$Q = 1.331K^{0.749}N^{0.251}$$

IV LABOR FORCE

(29) Number of Workers of Big Businesses

$$NW_b = 962.6 + 0.024Y_b - 0.024K_b + 0.820NW_{b-1}$$
$$(5.546) \quad (5.523) \quad (11.03)$$
$$\bar{R}^2 = 0.948 \quad DW = 0.282 \quad (1966\text{–}79)$$

(30) Number of Workers of Small Businesses

$$NW_s = 9436.7 + 0.177Y_s$$
$$(17.52)$$
$$\bar{R}^2 = 0.956 \quad DW = 2.559 \quad (1965\text{–}79)$$

(31) Number of Workers of Other Enterprises

$$NW_o = 10044.7 + 0.052Y_o - 0.144K_o$$
$$(0.620) \quad (2.226)$$
$$\bar{R}^2 = 0.624 \quad DW = 1.973 \qquad (1965\text{–}79)$$

(32) Number of Self-employed, Agricultural

$$N_a = 950.1 + 31.01PA/W + 0.581N_{a-1}$$
$$(4.315) \quad (6.635)$$
$$\bar{R}^2 = 0.996 \quad DW = 1.792 \qquad (1966\text{–}78)$$

(33) Number of Self-employed

$$N_{ia} = N_i + N_a$$

(34) Number of Totl Total Employment

$$NW = NW_b + NC_b + NW_s + NC_s + NW_o + NW_i$$

(35) Number of Labor Engaged

$$N = NW + N_{ia}$$

(36) Number of Labor Force Working Population

$$LF = 14230.6 + 538.3EKR + 0.463NO$$
$$(2.829) \quad (30.24)$$
$$\bar{R}^2 = 0.930 \quad DW = 2.264 \qquad (1965\text{–}79)$$

(37) Number of Unemployment

$$U = LF - N$$

(38) Unemployment Ratio

$$UR = U/LF \times 100$$

(39) Opening-to-application Ratio

$$EKR = -0.757 + 7.007IF/K + 0.213DUM721732$$
$$(17.14) \quad (6.916)$$
$$\bar{R}^2 = 0.975 \quad DW = 2.710 \qquad (1965\text{–}79)$$

(NW_i, N_i, NC_s, NC_b, NO = exogenous variables)

V WAGES AND SALARIES

(40) Wage per Worker of Big Businesses (annual)

$$lnW_b = -3.243 + 0.604lnPC + 0.602lnY_b/NW_b + 0.461lnW_{b-1}$$
$$(1.779) \quad (3.489) \quad (2.043)$$
$$\bar{R}^2 = 0.995 \quad DW = 0.713 \qquad (1966\text{–}79)$$

(41) Wage per Worker of Small Businesses (annual)

$$lnW_s = -4.144 + 0.795lnPC + 0.826lnY_s/NW_s + 0.213lnW_{s-1}$$
$$(5.183) \quad (9.894) \quad (1.968)$$
$$\bar{R}^2 = 0.999 \quad DW = 1.259 \qquad (1966\text{–}79)$$

(42) Salary per Executive of Big Businesses (annual)

$$W_{cb} = 0.942 + 1.300W_b + 0.163Y_b/NW_b$$
$$(14.84) \quad (1.506)$$
$$\bar{R}^2 = 0.990 \quad DW = 1.975 \qquad (1965\text{–}79)$$

(43) Salary per Executive of Small Businesses (annual)

$$W_{cs} = -0.003 + 1.100W_s + 0.156Y_s/NW_s$$
$$(22.87) \quad (2.730)$$

$\bar{R}^2 = 0.997 \quad DW = 2.158 \qquad (1965\text{–}79)$

(44) Wage per Worker of Personal Enterprises (annual)

$$lnW_i = \underset{}{-2.336} + \underset{(2.231)}{0.484 lnPC} + \underset{(5.025)}{0.874 lnY_i/(N_i+NW_i)} + \underset{(1.589)}{0.294 lnW_{i-1}}$$

$\bar{R}^2 = 0.987 \quad DW = 1.894 \qquad (1966\text{–}79)$

(45) Wage per Employee of Other Enterprises (annual)

$$W_o = \underset{}{-1.800} + \underset{(1.888)}{0.017 PC} + \underset{(5.930)}{0.410 Y_o/NW_o} + \underset{(3.507)}{0.444 W_{o-1}}$$

$\bar{R}^2 = 0.986 \quad DW = 1.246 \qquad (1966\text{–}79)$

(46) Average Wage (annual)

$$W = WNW/NW$$

VI DISTRIBUTION

(47) Total Compensation for Workers by Big Businesses

$$WNW_b = W_b \cdot NW_b$$

(48) Total Compensation for Workers by Small Businesses

$$WNW_s = W_s \cdot NW_s$$

(49) Total Compensation for Executives by Big Businesses

$$WNC_b = WC_b \cdot NC_b$$

(50) Total Compensation for Executives by Small Businesses

$$WNC_s = WC_s \cdot NC_s$$

(51) Total Wage and Salary for Employees by Other Enterprises

$$WNW_o = W_o \cdot NW_o$$

(52) Total Wage for Workers by Personal Enterprises

$$WNW_i = W_i \cdot NW_i$$

(53) Total Compensation for Employees

$$WNW = WNW_b + WNW_s + WNC_b + WNC_s + WNW_o + WNW_i$$

(54) Corporate Dividend Payments from Big Businesses

$$DIV_b = \underset{}{170.1} + \underset{(2.269)}{0.009(Y_b \cdot P)} + \underset{(3.365)}{0.604 DIV_{b-1}}$$

$\bar{R}^2 = 0.984 \quad DW = 1.758 \qquad (1966\text{–}79)$

(55) Corporate Dividend Payments from Small Businesses

$$DIV_s = \underset{}{155.6} + \underset{(5.654)}{0.037(Y_s \cdot P - DEP_s - WNW_s - WNC_s)} + \underset{(3.904)}{0.392 DIV_{s-1}} + \underset{(4.728)}{242.8 DUM73}$$

$\bar{R}^2 = 0.982 \quad DW = 1.794 \qquad (1966\text{–}79)$

(56) Corporate Dividend Payments from Other Enterprises

$$DIV_o = \underset{}{17.40} + \underset{(1.462)}{0.015(Y_o \cdot P)} + \underset{(3.264)}{0.786 DIV_{o-1}}$$

$\bar{R}^2 = 0.958 \quad DW = 2.642 \qquad (1966\text{–}79)$

(57) Corporate Dividend Receipts by Households

$$YDIV = \underset{}{22.50} + \underset{(68.97)}{0.556(DIV_b + DIV_s + DIV_o)}$$

$\bar{R}^2 = 0.997 \quad DW = 1.612 \qquad (1965\text{–}79)$

(58) Corporate Profit of Big Businesses

$$\pi F_b = Y_b \cdot P - DEP_b - WNW_b - WNC_b - DIV_b - OC_b$$

(59) Corporate Profit of Small Businesses

$$\pi F_s = Y_s \cdot P - DEP_s - WNW_s - WNC_s - DIV_s - OC_s$$

(60) Corporate Profit of Other Enterprises

$$\pi F_o = Y \cdot P - DEP - TI - SUB - DISC - WNW - ETWNW - OC - RENT - INT - YDIV - \pi F_b - \pi F_s - \pi_{ia}$$

(61) Total Corporate Profit

$$\pi F = \pi F_b + \pi F_s + \pi F_o$$

(62) Income of Self-employed

$$\pi_{ia} = Y_{ia} \cdot P - DEP_{ia} - WNW_i$$

(63) Business Surplus of Self-employed

$$BS_{ia} = \underset{(71.39)}{-1308.0 + 1.304\pi_{ia}}$$

$\bar{R}^2 = 0.997 \quad DW = 1.207 \qquad (1965\text{–}79)$

(64) Income of Interest to Households

$$INT = \underset{(64.38)}{-1006.0 + 0.008(I \cdot SSH)} \underset{(6.619)}{- 1649.9 DUM79}$$

$\bar{R}^2 = 0.997 \quad DW = 1.908 \qquad (1965\text{–}79)$

(65) Personal Disposable Income

$$YD = WNW + ETWNW + BS_{ia} + YDIV + RENT + INT + TRINH - CD - (TH + TREXH + ACEX - ACIN)$$

(66) Personal Disposable Income by Wage-earning Households

$$YD_w = WNW + ETWNW - WNC_b - WNC_s - CD - RTRINH - (TH + TREXH + ACEX - ACIN) \times \frac{(WNW + ETWNW - WNC_b - WNC_s)}{(WNW + ETWNW + BS_{ia} + RENT + YDIV + INT)}$$

(67) Personal Disposable Income by Nonwage-earning Households

$$YD_c = YD - YD_w$$

(68) Household Saving

$$SH = YD - (C - CNP) \cdot PC$$

(69) Personal Income Tax

$$TF = TF_b + TF_s + TF_o$$

($ETWNW$, CD, $TRINH$, $TREXH$, $ACEX$, $ACIN$, $RENT$, TF_b, TF_s, TF_o, TH, TH_{ia} = exogenous variables)

VII STOCKS

(70) Depreciation in Big Businesses

$$DEP_b = \underset{(31.09)}{371.6 + 0.117 K_b \cdot PIF}$$

$\bar{R}^2 = 0.986 \quad DW = 0.665 \qquad (1965\text{–}79)$

(71) Depreciation in Small Businesses

$$DEP_s = 325.9 + \underset{(30.30)}{0.164} K_s \cdot PIF$$

$\bar{R}^2 = 0.985 \quad DW = 1.945 \qquad (1965\text{–}79)$

(72) Depreciation in Other Enterprises

$$DEP_o = 364.5 + \underset{(10.79)}{0.081} K_o \cdot PIF$$

$\bar{R}^2 = 0.892 \quad DW = 1.103 \qquad (1965\text{–}79)$

(73) Depreciation in Personal Enterprises

$$DEP_{ia}/PIF = 648.2 + \underset{(15.14)}{0.086} K_{ia}$$

$\bar{R}^2 = 0.942 \quad DW = 0.506 \qquad (1965\text{–}79)$

(74) Depreciation in Housing Owned by Households

$$DEPH/PIH = 524.2 + \underset{(34.01)}{0.046} KH$$

$\bar{R}^2 = 0.988 \quad DW = 1.226 \qquad (1965\text{–}79)$

(75) Total Depreiation in Enterprises

$$DEPF = DEP_b + DEP_s + DEP_o + DEP_{ia}$$

(76) Fixed Capital Stock in Big Businesses

$$K_b \cdot PIF = K_{b-1} \cdot PIF_{-1} + IF_{b-1} \cdot PIF_{-1} - DEP_{b-1}$$

(77) Fixed Capital Stock in Small Businesses

$$K_s \cdot PIF = K_{s-1} \cdot PIF_{-1} + IF_{s-1} \cdot PIF_{-1} - DEP_{s-1}$$

(78) Fixed Capital Stok Stock in Other Enterprises

$$K_o \cdot PIF = K_{o-1} \cdot PIF_{-1} + IF_{o-1} \cdot PIF_{-1} - DEP_{o-1}$$

(79) Fixed Capital Stokc in Personal Enterprises

$$K_{ia} = K_{ia-1} + IF_{ia} - (DEP_{ia}/PIF)_{-1}$$

(80) Gross Fixed Capital Stock

$$K \cdot PIF = K_{-1} \cdot PIF_{-1} + IF_{-1} \cdot PIF_{-1} - DEPF_{-1}$$

(81) Inventory Stocks in Big Businesses

$$S_b = S_{b-1} + J_{b-1}$$

(82) Inventory Stocks in Small Businesses

$$S_s = S_{s-1} + J_{s-1}$$

(83) Inventory Stocks in Other Enterprises

$$S_o = S_{o-1} + J_{o-1}$$

(84) Inventory Stocks in Personal Enterprises

$$S_{ia} = S_{ia-1} + J_{ia-1}$$

(85) Gross Inventory Stocks

$$S = S_{-1} + J_{-1}$$

(86) Housing Stock Owned by Households

$$KH = KH_{-1} + IH_{-1} - DEPH/PIH$$

(87) Stocks of Personal Saving

$$SSH = SSH_{-1} + SH$$

VIII DEFLATORS

(88) Domestic Deflator

$$\widehat{PD} = 0.177 + \underset{(16.96)}{0.588}(0.6\widehat{WPIP} + 0.2\widehat{W} + 0.2\widehat{PIF}) + \underset{(2.655)}{0.309}\{D/(Q+S)\}_{-1} - \underset{(5.993)}{0.063}DUM79$$

$\bar{R}^2 = 0.963 \quad DW = 2.405 \quad (1967\text{–}79)$

(89) Private Consumption Deflator

$$PC = -52.76 + \underset{(56.36)}{1.013}PD + \underset{(1.565)}{32.55}\widehat{C} + \underset{(1.039)}{15037.4}TI/(Y \cdot P)$$

$\bar{R}^2 = 0.998 \quad DW = 1.092 \quad (1966\text{–}79)$

(90) Capital Investment Deflator

$$\widehat{PIF} = -0.225 + \underset{(14.69)}{1.152}\widehat{PD} + \underset{(0.828)}{0.032}\widehat{IF}$$

$\bar{R}^2 = 0.952 \quad DW = 0.914 \quad (1966\text{–}79)$

(91) House Investment Deflator

$$\widehat{PIH} = -0.483 + \underset{(7.629)}{1.213}\widehat{PIF} + \underset{(2.457)}{0.264}\widehat{IH} + \underset{(2.450)}{0.074}DUM79$$

$\bar{R}^2 = 0.826 \quad DW = 2.054 \quad (1966\text{–}79)$

(92) Price Index for Agricultural Products

$$lnPA = 0.421 + \underset{(26.73)}{1.145}lnPD - \underset{(2.373)}{0.175}lnRMFR$$

$\bar{R}^2 = 0.995 \quad DW = 1.959 \quad (1965\text{–}79)$

(93) Inventory Deflator

$$PJ = 25.98 + \underset{(16.11)}{0.735}PD$$

$\bar{R}^2 = 0.949 \quad DW = 1.633 \quad (1965\text{–}79)$

(94) Export Deflator

$$\widehat{PE} = -0.879 + \underset{(11.19)}{1.676}\widehat{PD} + \underset{(2.242)}{0.019}D/S + \underset{(5.723)}{0.153}DUM79$$

$\bar{R}^2 = 0.915 \quad DW = 1.777 \quad (1966\text{–}79)$

(95) GNP Deflator

$$P = (PC \cdot C + PIF \cdot IF + PIH \cdot IH + PJ \cdot J + GIN + GCN + PE \cdot E + PET \cdot ET - PM \cdot M - PMT \cdot MT)/Y$$

(96) Government Investment Deflator

$$PGI = -15.24 + \underset{(71.96)}{1.137}PIF$$

$\bar{R}^2 = 0.997 \quad DW = 2.636 \quad (1965\text{–}79)$

(97) Government Consumption Deflator

$$PGC = -32.52 + \underset{(80.41)}{1.307}P$$

$\bar{R}^2 = 0.998 \quad DW = 1.351 \quad (1965\text{–}79)$

IX FINANCIAL

(98) Average Loan Rate by All Banks

$$INR = 2.081 + 0.499ODR + 0.335INR_{-1}$$
$$(21.16) \quad (8.106)$$
$$\bar{R}^2 = 0.980 \quad DW = 1.625 \quad (1966\text{–}79)$$

LIST OF VARIABLES

$\overline{\quad}$ over variable name shows exogenous variable.
ARNA: Annual Report of National Accounts
UES: Unincorporated Enterprise Survey
ESM: Economic Statistics Monthly
SFHE: Survey of Farm Household Economy
MBS: Monthly Bulletin of Statistics
LFS: Labor Force Survey
FS: Financial Statistics
SIE: Statistical Survey of Incorporated Enterprises
SPAI: Statistics of Production and Agricultural Income
SPWAC: Statistics of Prices and Wages in Agricultural Community
FTSJ: Foreign Trade Statistics of Japan
WPI: Wholesale Price Indexes, Producer Price Indexes for Manufactured Products, and Input-output Price Indexes by Manufacturing Industry Sector Annual

variable	explanation	unit	source
$\overline{ACEX}$	personal contribution to insurance	billions of current yen	ARNA
$\overline{ACIN}$	personal benefit of insurance	billions of current yen	ARNA
BS_{ia}	business surplus of self employed	billions of current yen	ARNA
C	personal consumption	billions of 1975 yen	ARNA
$\overline{CD}$	interest on consumer debt	billions of current yen	ARNA
$\overline{CNP}$	consumption by private non-profit institutions serving households	billions of 1975 yen	ARNA
$D_{(-b,s,o,ia)}$	demands	billions of 1975 yen	ARNA, SIE
$DEP_{(-b,s,o,ia)}$	depreciation	billions of current yen	ARNA, SIE
$DEPF$	total depreciation in enterprises	billions of current yen	ARNA
$DEPH$	depreciation in housing owned by households	billions of current yen	ARNA etc
$\overline{DISC}$	statistical discrepancy	billions of current yen	ARNA
$DIV_{(-b,s,o)}$	dividend	billions of current yen	ARNA, SIE
$\overline{DUM(X)}$	=1 for year of X ;=0 otherwise		
$\overline{DUM\ 6572}$	=1 for 1965–72 ;=0 otherwise		
$\overline{DUM\ 6573}$	=1 for 1965–73 ;=0 otherwise		
$\overline{DUM\ 7375}$	=1 for 1973–75 ;=0 otherwise		
$\overline{DUM\ 7579}$	=1 for 1975–79 ;=0 otherwise		
$\overline{DUM\ 721732}$	=1 for 1972 ;=2 for 1973 ;=0 otherwise		
E	export of goods and services	billions of 1975 yen	ARNA

variable	explanation	unit	source
EKR	opening-to-application ratio		LFS
$\overline{ET}$	factor income received from abroad	billions of 1975 yen	ARNA
$\overline{ETWNW}$	compensation of employees received from abroad	billions of current yen	ARNA
$\overline{FL}_{(-b,s)}$	net increase in long-term borrowings from banks-interest and discount payable	billions of current yen	SIE
GC	government consumption	billions of 1975 yen	ARNA
$\overline{GCN}$	government consumption	billions of current yen	ARNA
GI	government investment	billions of 1975 yen	ARNA
$\overline{GIN}$	government investment	billions of current yen	ARNA
$IF_{(-b,s,o,ia)}$	fixed capital formation	billions of 1975 yen	ARNA, SIE
IH	house housing construction by households	billions of 1975 yen	made by ARNA, SIE
INR	average loan rate by all banks	%	ESM
$J_{(-b,s,o,ia)}$	increase in stocks	billions of 1975 yen	ARNA, SIE
$K_{(-b,s,o,ia)}$	fixed capital stock (beginning of year)	billions of 1975 yen	ARNA, SIE
KH	housing stock owned by households (beginning of year)	billions of 1975 yen	ARNA, SIE
LF	labor force working pouplation	thousand persons	LFS
M	import of goods and services	billions of 1975 yen	ARNA
$\overline{MT}$	factor income paid abroad	billions of 1975 yen	ARNA
N	number of labors engaged	thousand persons	LFS
Na	number of self-employed, agricultural	thousand persons	LFS
$\overline{NC}_{(-b,s)}$	number of executives of enterprises	thousand persons	LFS
$\overline{N}_i$	number of self-employed, non-agricultural	thousand persons	LFS
N_{ia}	number of self-employed	thousand persons	LFS
N_{ig}	$=N_i+NW_i$	thousand persons	LFS
$\overline{NO}$	number of working age population	thousand persons	LFS
$NW_{(-b,s,o)}$	number of employment	thousand persons	LFS, SIE
$\overline{NW}_i$	number of employees of personal enterprises	thousand persons	LFS
$\overline{OC}$	other costs	billions of current yen	ARNA, SIE
$\overline{ODR}$	official rate	%	ESM
P	GNP deflator	1975=1.0	ARNA
PA	price index for agricultural products	1975=1.0	SPWAC
PC	deflator for private final consumption	1975=1.0	ARNA
PD	domestic deflator	1975=1.0	made by ARNA
PE	deflator for export of goods and services	1975=1.0	ARNA
$\overline{PET}$	deflator for factor income received from abroad	1975=1.0	ARNA
PGC	deflator for government final consumption	1975=1.0	ARNA
PGI	deflator for government fixed capital formation	1975=1.0	ARNA
PIF	deflator for private fixed capital formation	1975=1.0	ARNA
PIH	deflator for housing investment	1975=1.0	ARNA
PJ	deflator for inventory investment	1975=1.0	ARNA
$\overline{PM}$	deflator for import of goods and services	1975=1.0	ARNA

variabel	explanation	unit	source
$\overline{PMT}$	deflator for factor income paid abroad	1975=1.0	ARNA
$\overline{PW}$	price index of world trade	1970=1.0	MBS
Q	productive capacity	billions of 1975 yen	
$\pi F_{(-b,s,o)}$	entrepreneural income, before tax after dividend	billions of current yen	ARNA, SIE
π_{ia}	income of self-employed	billions of current yen	ARNA
$\overline{RATE}$	exchange rate	yen per dollar	FTSJ
$\overline{RENT}$	rentier income of households	billions of current yen	ARNA
$\overline{RMFR}$	dependence on imports of agricultural products		made by FTSJ, SFHE, SPAI etc
$S_{(-b,s,o,ia)}$	inventory stocks (beginning of year)	billions of 1975 yen	ARNA, SIE
SH	increase in stocks of personal saving	billions of current yen	ARNA
SSH	stocks of personal saving (end of year)	billions of current yen	ARNA
$\overline{SUB}$	subsidies	billions of current yen	ARNA
$\overline{TI}$	indirect tax	billions of current yen	ARNA
$\overline{TF}_{(-b,s,o)}$	corporate business tax	billions of current yen	ARNA, SIE
$\overline{TH}$	personal direct tax	billions of current yen	ARNA
$\overline{TH}_{ia}$	returned income tax on personal enterprises	billions of current yen	FS
$\overline{TREXH}$	transfer from households	billions of current yen	ARNA
$\overline{TRINH}$	transfer to households	billions of current yen	ARNA
U	number of unemployment	thousand persons	LFS
UR	unemployment ratio	%	LFS
$W_{(-b,s,o,i)}$	wage per worker (annual)	millions of current yen	ARNA, LFS, UES, SIE etc
$WC_{(-b,s)}$	salary per executive (annual)	millions of current yen	SIE
WNW	domestically paid compensation for employees	billions of current yen	ARNA
$WNW_{(-b,s,o,i)}$	compensation for employees	billions of current yen	ARNA, LFS, UES, SIE
$WNC_{(-b,s)}$	compensation for executives	billions of current yen	SIE
$\overline{WPIP}$	wholesale price index for productive goods	1975=1.0	WPI
$\overline{WT}$	quantity index of world trade	1970=100	MBS
$Y_{(-b,s,o,i,ia)}$	production	billions of 1975 yen	made by ARNA, SFHE, SPAI, SPWAC, SIE
$\overline{Y_{an}}$	net agricultural product	billions of current yen	SPAI
YD	personal disposable income	billions of current yen	ARNA
YD_e	personal disposable income of wage earning	billions of current yen	ARNA
YD_w	personal disposable income of non-wage earning	billions of current yen	ARNA
$YDIV$	corporate dividend payment to households	billions of current yen	ARNA etc

1) 'b' shows big business. 's' shows small business. 'o' shows other enterprises. 'ia' shows personal enterprise. 'i' shows non-agricultural personal enterprise. 'a' shows agriculture.

2) These are data of fiscal year.

3) Data of calendar year are translated to data of fiscal year by the next formula.

$$\text{data of fiscal year } t = \frac{(\text{data of calendar year } t \times 3 + (\text{data of calendar year } t+1)}{4}$$